

WCM-300 Wireless Charger

Instruction Manual (WCM-300 V2.6)

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Catalog

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1 Product Introduction

1.1 Summary

WCM-300 is a high-performance wireless charger product, suitable for providing non-contact charging for various mobile robots or devices (such as AGV, AGC, RGV, golf carts and hotel service robots), which can realize the battery charging process. It is fully automated, easy to use, and simple to maintain.

WCM-300 adopts adaptive control technology to overcome the impact of charging distance and load changes on system performance, high control accuracy, and can provide accurate and reliable charging, protection and extension for lithium batteries, lead-acid batteries, nickel metal hydride batteries and super capacitors Battery Life.

The output power of WCM-300 is 300W, and the wireless transmission efficiency is better than 85%. The intensity of electromagnetic radiation meets the requirements of “Control Limits for Electromagnetic Environment (GB 8702-2014)”, which is safe, green and energy-saving.

All key components in this product are imported components, and have undergone rigorous machine testing to ensure long-term stable operation.

1.2 Features

- * Non-contact charging, high work efficiency, long life, and fragmentation of charging time;
- * Original multi-loop resonance design, low loss, transmission frequency bandwidth;
- * Original multi-loop adaptive control algorithm to ensure that the system is always in the best working state;
- * Independently developed 2.4GHz frequency hopping communication algorithm with low data transmission delay and strong anti-interference ability;
- * Autonomous position confirmation algorithm to effectively prevent charging malfunction;
- * Multiple overload protection design to ensure stable and reliable equipment

operation;

* The integrated structure of transformer and control circuit saves space and is easy to install;

2 Technical Parameters

Input voltage: AC220V $\pm 15\%$, single phase 50Hz

Input current: 3A (maximum)

Output voltage: 28.8V

Output current: 7A

Voltage Accuracy: $\pm 0.3\%$

Stability accuracy: $\pm 1.0\%$

Voltage ripple: $\leq 0.3\%$

Wireless efficiency: $\geq 85\%$

Charging distance: Air gap length: 0mm \sim 50mm

X axis deviation: $\pm 30\text{mm}$

Y-axis deviation: $\pm 30\text{mm}$

Charging frequency: 10 \sim 50kHz (self-tuning)

Data transmission: Working frequency band: 2.400 \sim 2.485GHz

Transmit power: 0dBm

Ambient temperature: -20 \sim + 50 $^{\circ}\text{C}$

Storage temperature: -30 \sim + 60 $^{\circ}\text{C}$

Insulation resistance: $\geq 100\text{M}\Omega$

Protection level: IP65

Cooling method: natural cooling in ventilation environment

Withstand voltage: AC1750V (1min)

Impact resistance: 10G (omnidirectional)

Vibration resistance: 19.6m / sec² (10 \sim 55Hz)

Dimensions: 240 (W) x 210 (H) x 65 (D) mm 3

Weight: about 5kg

3 Function and operation

3.1 Function

WCM-300T power terminal indication function:

(1) After the power is turned on normally, the red indicator light is always “on” and goes off for 1 second, and enters the standby state;

(2) When the power receiving terminal is in place and communication is normal, the coupling detection phase is performed, and the green indicator light enters the "on" state;

(3) After the coupling detection is passed, the green indicator light enters the fast flashing state, indicating that it has entered the normal charging state;

(4) After the charging is completed, the power-side indicator is in standby state, and the red indicator enters a slow flashing state.

WCM-300R power receiving terminal indication function: (Take the robot as an example: the power receiving terminal is on the robot)

(1) After the battery is normally connected, the red indicator light is always “on” and goes off for 1 second, and it enters the standby state. If the indicator light does not indicate, it is always “off”;

(2) When the power receiving end reaches the charging position, the robot gives a charging signal (active high level), and the green indicator light enters a slow flashing state;

(3) After normal charging, the green indicator on the receiving end flashes quickly;

(4) If the receiving end is locked due to a fault or the position is inaccurate, the red indicator on the receiving end enters a fast flashing state;

(5) After charging is completed, the indicator on the receiving end is off.

3.2 Power-on operation

(1) After the wiring harness is properly connected, connect the power plug of the power end to a single-phase 220V power socket. The specific wiring is shown.

The intention is shown in Figure 2;

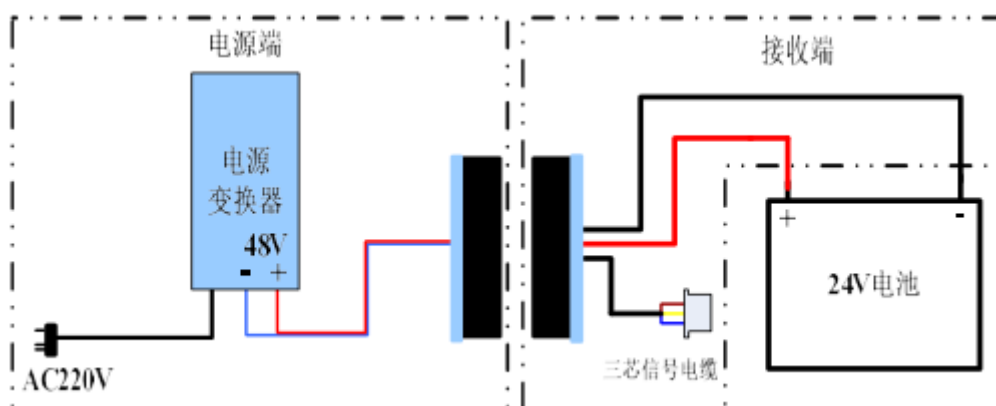


Figure 2 WCM-300 wiring diagram

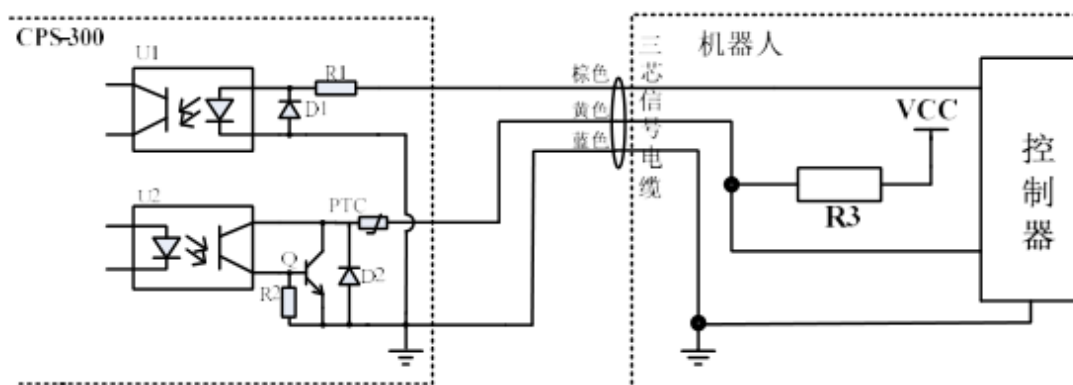


Figure 3 Schematic diagram of three-core signal cable connection

Note: Brown is the start-up control line, which is effective at high level, and the input voltage is 3 ~ 30VDC;

Yellow is fault indication line, low level is valid, OC output, maximum sink current 200mA, withstand voltage 30VDC;

Blue is the signal ground.

Figure 3 is a reference wiring diagram. When the robot is charging in place, the controller directly outputs a high-level (voltage 3 ~ 30VDC) signal to the brown line to start charging; when it needs to stop charging, the controller directly outputs a low-level signal to Brown wire, stop charging.

The fault signal wiring is shown in the figure. It is connected to VCC through the pull-up resistor R3 (note whether the internal level of the

controller is consistent with the VCC voltage). The value of resistor R3 is related to the size of VCC (maximum sink current 200mA, withstand voltage 30VDC). . Under normal circumstances, the yellow fault indication line shows a high-level state. When there is a fault or the parking is inaccurate, the yellow fault indication line shows a low-level state. The charger is in a locked state. The lock can be unlocked by resetting the start signal Dead state.

(2) The power indicator is as described in "WCM-300T Power Side Indication Function";

(3) After the power receiving end is connected to the battery, the power indicator is as described in "WCM-300R power receiving end indication function".

3.3 Charging operation

The WCM-300R power receiving end is close to the WCM-300T power end. After reaching the charging range, the robot gives a charging signal.

The charger starts the intelligent charging process. The specific instructions are as described in 4.1.

4 Installation method

4.1 Equipment composition

The device consists of two parts:

- (1) wireless transmitter;
- (2) Wireless receiver.

4.2 Installation

- (1) The power terminal of the WCM-300 charger is fixed in the charging area;
- (2) The power receiving end (wireless receiver) of the WCM-300 charger is fixed on the robot;
- (3) There is no metal within 2cm around the wireless transmitter of WCM-300 receiving end and power end, as shown in Figure 4 below, $A \geq 2\text{cm}$;

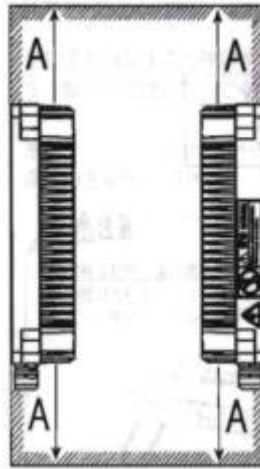


Figure 4 Installation safe space

4.3 Dimensions and installation dimensions

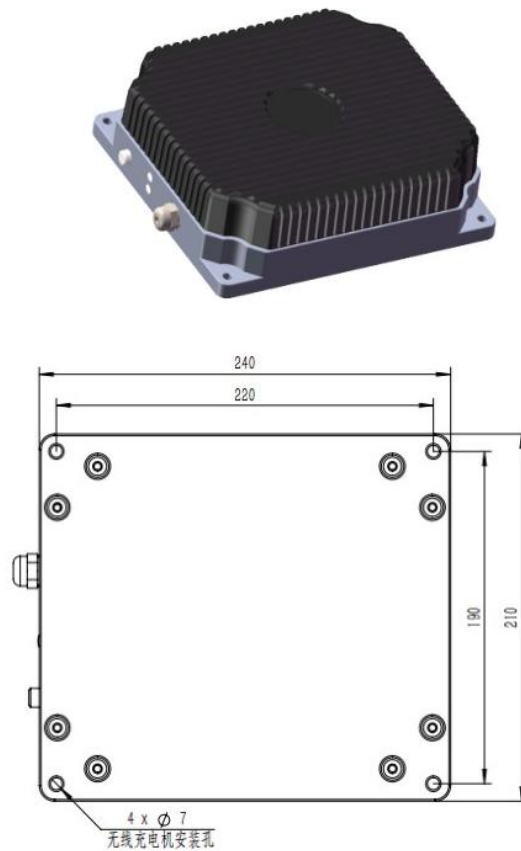


Figure 5 Dimensions and installation dimensions (unit: mm)

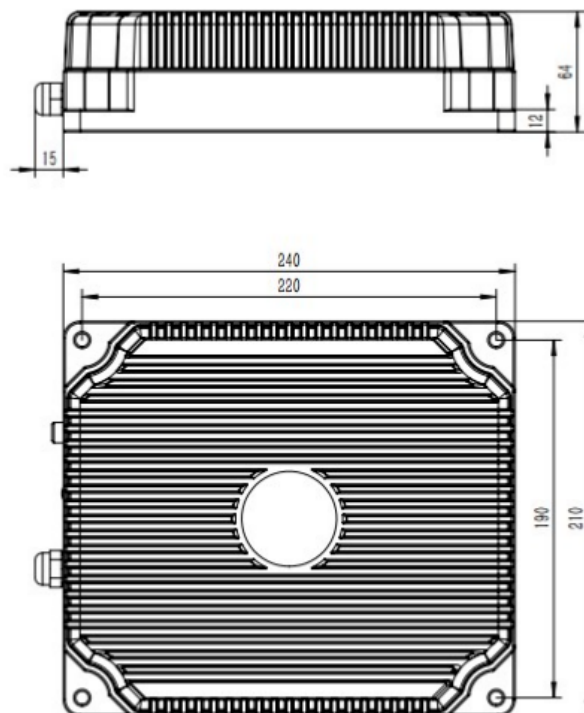


Figure 6 Dimensional Drawing (Unit: mm)

5 Common faults and troubleshooting

5.1 WCM-300T power supply side failure and troubleshooting

(1) If a green light “off” and a red light “on” appear during the coupling detection stage after the robot gives a charging signal, the coupling detection may not pass. First check the distance and offset of the device. If it is out of range, you need to adjust the position again; if it is in range, wait for one minute and the system will automatically re-identify. The power-receiving terminal runs after it is powered on again.

(2) If the red light on the power supply is always “on” or the green light is always on, or the red and green lights are always on, you need to power on again. Electricity.

(3) If the indicators on the power supply are always off, and the red light does not indicate when the power supply is powered on again, check whether the single-phase 48V input is normal, and if it is normal, check whether the wiring has a virtual connection.

(4) If the power end is near the power receiving end, the robot gives a charging signal, the power receiving end indicates that the green light has entered a normal blinking state, and the power end indicates that the red light is still in a slow flashing state. Both are running after power cycle.

5.2 WCM-300R receiving end fault and troubleshooting

(1) If the receiving end is close to the power end, the charging position is normal, the robot gives a charging signal, and the green indicator light is off, the receiving end needs to be powered on again.

(2) If the power receiving end is close to the power end, the charging position is normal, the robot gives a charging signal, and the green indicator light is always in a slow flashing state.

(3) If the red light on the receiving end flashes, the robot can remove this state by turning off the charging signal.